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Native and Introduced
Grasses and their
Economic Value

Agronomy

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NATIVE AND INTRODUCED GRASSES
AND
THEIR ECONOMIC VALUE

BY

HARRY BENJAMIN DERR

Thesis for the Degree of Bachelor of Science
in Agronomy

COLLEGE OF AGRICULTURE
UNIVERSITY OF ILLINOIS

1905

NATIVE AND INTRODUCED GRASSES

AND

THEIR ECONOMIC VALUE

BY HENRY BELLAMY

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NATIVE AND INTRODUCED GRASSES OF ILLINOIS,

-AND-

THEIR ECONOMIC VALUE.

There are nearly four thousand distinct species of Grasses distributed throughout the world, and about one-third of this number are native of North America.

In the State of Illinois we have growing wild about one hundred and sixty species of grasses included in sixty-four different genera. No doubt there are other species not yet found, but the above number includes the present known forms, that are of interest to the Agriculturist. The object of this paper, is to describe these grasses, in such a manner as to give some idea of their relative importance.

That these grasses to be described, will compose only an arbitrary list, is well known, as many of our grasses were of economic importance before they escaped from cultivation, and are still of considerable worth, in some localities, when kept within bounds. Some of these grasses have a very restricted range, and are but rarely found. Among these we find some growing in sandy places. Some flourish in moist meadows, while others only exist in the dryest situations. Some grow in shady woods and thickets, while others thrive only on the open prairies. Some are confined to heavy soils, others to loose friable loams. Some prefer soils containing considerable lime, others do better without. It is with all the varied peculiarities of grasses, their individual

characteristics, the soil and conditions best suited to their growth, their palatability and productiveness, that the farmer is more or less interested.

Of the large number of grasses in our state, not all are useful. Some of them appear to be worthless, and a number are absolutely injurious to agriculture, by possessing the character of weeds.

A weed is classified as a plant out of place, and it is this habit of getting out of place, that has caused considerable annoyance to the farmers of this state. Many of the weeds of the grass family, make their appearance early in the season, and their seeds ripen, and fall quickly. Others produce seeds continuously throughout the summer. The plants produced by the first crop of seeds are frequently destroyed, but are followed by others which are produced by such seeds as did not germinate at first, owing perhaps to being covered too deeply in the soil, the cultivation bringing them nearer the surface, thus allowing them to germinate and produce young plants. Probably the worst, or at least among the worst of the weeds in cultivated fields, are found in the grass family. Among these may be mentioned the foxtails, barnyard grass, pigeon grass, crab grass, tickle grass, and drop seed grass. Of these mentioned, nearly all are widely distributed over the state, and in some localities are rapidly becoming serious pests.

The central and northern portions of the state, being covered with a rich, dark soil, are infested with a large number of the weedy grasses, while the southern portion of the state, with its lighter soil, is much less infested. Some of these grasses, which

are injurious in the northern part of the state, are quite beneficial in the southern part, where they furnish feed to grazing cattle, and produce a large part of the so called poor man's hay.

HOW TO AVOID, AND COMBAT THE WEEDY GRASSES.

To avoid introducing, or propogating weeds, is better than to expend labor in afterward destroying them. Some principles of weed destruction can be universally applied. It behooves us then, to prevent the seeding of the weedy grasses, and the dissemination of weed seeds, by their being mixed with other seeds planted. These weedy grasses are all included in the three groups known as Annual, Biennial, and Perennial.

The Annuals are those which grow from seed each season, or year, and die after ripening their seeds. Among these are the crab grasses, foxtails, Chess and wild rye. The two latter are called winter annuals as they spring from seed produced in the summer, and live over winter as small seedlings.

The Biennial grasses are those that grow from seed, but do not produce seed until the second season. Fortunately there are not many biennial grass weeds.

The Perennial grasses are those that live year after year, without renewal from any apparent source. They grow from seeds, rootstocks, or underground stems, once started they continue in the same spot, or in the near vicinity, and are usually very difficult to eradicate.

Successful measures in destroying weeds, are founded upon a knowledge of the life of the weed and its manner of propagation. In the methods of eradication of the Biennial and Perennial weedy grasses, especially those with large underground stems, or extensive root systems, the tops must be cut off frequently to starve out these subterranean parts, as it is in these that the supply of plant food is stored. In this class, the green leaves are the feeding organs, which must be removed.

It is recommended that Salt, Kerosene, or Acids be applied to the root stock after cutting off the stem. Salting, however, is not successful with some of the weedy grasses. Cutting and burning is the most economical and effective method of combattint the greater number of them.

Some of the grasses that grow only upon low wet lands, and meadows, can be eradicated by tile drainage, which removes the surplus water, and lowers the water table below their roots. Of the grasses which grow only on poor soil, many can be crowded out by enriching the land, so that rapidly growing vegetation will smother them, and prevent their forming seed.

In the following descriptions the term, "period of fruitage" is used to designate the time between the beginning of the flowering season, and ripening of the seeds.

The illustrations of the various forms of Panicles and Spikes are added, to aid the reader to a better understanding of the descriptions.



ELYMUS.



BROMUS.



CAREX.

Compound Spike.



LOLIUM.

Spike.

Various Forms of Spikes



Various Forms of Panicles.



TRIPSACUM DACTYLOIDES.

L.

Gama grass.

A stout, coarse, branching perennial three to six feet high with long and rather broad leaves and a spicate inflorescence, the spikes being two to four on the main stem and usually solitary on the branches. The stems arise from thick creeping root stocks. Found only along streams, moist thickets and ditches. It is one of our tallest grasses and in some places is used for fodder. It should be cut green, as later the stems become woody and unpalatable. Period of fruitage, June to September.

ERIANTHUS ALOPECUROIDES.

(L.) Ell.

Spiral-awned Plume grass.

Culms stout, erect, four to six feet in height, the summit and axis of the panicle densely pubescent. Sheaths smooth, leaves six to twenty-four inches in length. Panicle oblong, six to twelve inches long, two to three inches wide, branches spreading, long, slender, loose, awns spiral. Fruits in September.

This grass grows in damp soil and in low places and this accounts for its rank growth. It is one of our rare grasses, as its native home seems farther south. This species spreads by means of a thick creeping root stock and from each node a strong culm arises. Owing to its being a perennial it is not easily eradicated.

Of no agricultural value.



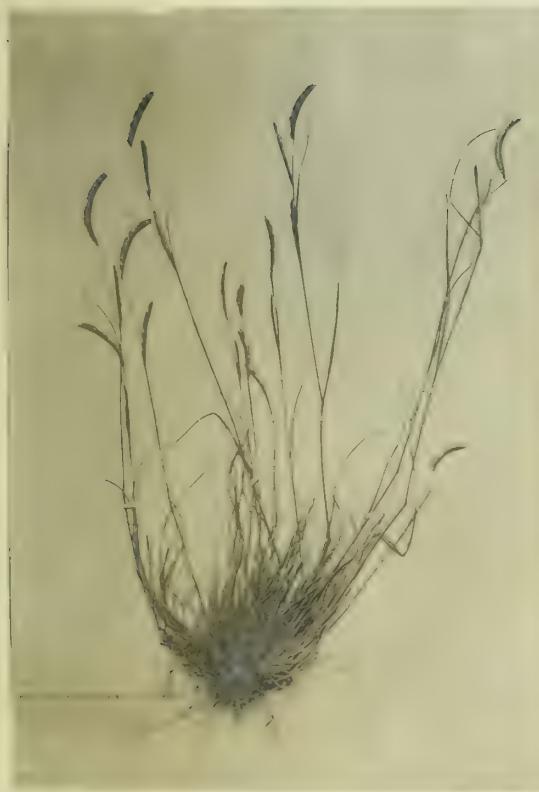
ANDROPOGON SCOPARIUS.

Mich.

Broom Beard Grass.

This is a perennial grass with long narrow leaves. It varies in height from two to four feet and the leaves from six to twelve inches long. Spikes one to two inches long, loose, solitary on slender stems. It is generally found in dry sandy fields and along woods from July to October, and in some places is cut for prairie hay, but is not as well liked as the blue stem. It has a similar range to the big blue stem and in Illinois is nearly always found with the big blue stem and bushy blue stem. In the southern states is valued for grazing. It is one of the late grasses and when not cut or grazed too closely is useful as an autumn pasturage plant. It seeds more freely than the big blue stem and for this reason holds on well. Stock will eat the grass when it is young and fresh, but when old and beginning to wither it becomes woody.

and unpalatable. The means of eradication are the same as for the broom sedge, that is by means of burning the seed, plowing up the roots, and by crop rotation.



Bouteloua oligostachys.
Page 14.



Paspalum laeve.
Page 64



ANDROPOGON VIRGINICUS.

L.

Broom sedge or Beard grass.

This is a perennial plant and is both beneficial and a noxious weed at different times.

It grows to a height of from two to four feet, and when young this grass affords most excellent grazing. Milch cows seem to do well upon it. When full grown the stems become too hard and woody for hay. Although this grass has some value when young, it becomes one of the worst weeds, and truly becomes a plant out of place. In the south where it is common it interferes seriously with the formation of permanent meadows. Constant tillage or very close grazing appears to be the only means of keeping this grass from crowding out the others and occupying the land. This grass will grow in both dry or moist soil, and is much easier started growing than it is gotten rid of when firmly established.

In eradicating this weed we must use two methods, removing the seeds which mature in the latter part of August and early in September, and also remove the dense matted roots as well. The tops can be cut off and the seeds burned, and the roots destroyed by plowing late in fall and harrowing.

A rotation with clover if possible will aid in smothering out this weed.

ANDROPOGON FURCATUS.

Muhl.

Forked Beard Grass.

This is a stout perennial grass, with erect, more or less branching, and often bluish or glaucus stems two to six feet high. This grass has a wide range and in many localities is quite abundant and is highly valued for hay. It grows in most any soil and climate, and for this reason is found in our prairies. The early growth consists of a great abundance of long leaves, and if cut in early bloom the hay is readily eaten by horses and cattle, but if allowed to fully mature, the stems become hard and woody, and the hay of inferior quality.

It is stated that this plant rarely matures its seed. It requires a very favorable season of moisture to make it fruit abundantly.

This lack of seeding prevents the propagation of the grass by the convenient method of sowing the seed.

SORGHASTRUM AVENACEUM.

(Mich.) Nash.

or (*Chrysopogon avenaceus*).

Indain Grass.

A stout perennial plant, culms erect from three to eight feet tall from a creeping root stock. Long leaf blades, and lengthy, rather dense, usually somewhat nodding, brownish panicles.

Usually found in dry fields, glades and borders of woods, from July to October.

This grass is usually abundant on the prairies and is highly valued for hay. Its early growth in July and continuing through till October is of considerable value as a feed. Much of this species is cut as prairie hay. It makes good hay and stock eat it readily. In South Dakota it is given the first place among the native grasses as a hay producing species, thriving best on the rich prairie bottoms. During the dry season it produces but little seed, though it usually makes a good growth of root leaves. Owing to its lack of seeding there is more of the nutrient in the plant than there would be if seed were produced.



SORGUM HALPENSE.

(L.) Pers.

Johnson Grass.

A stout perennial with smooth, erect culms. Three to six feet high, and strong, creeping root stocks. The panicles are expanded during flowering and are from six to twelve inches long. It makes a rapid growth, and is but little affected by drought, and the hay, if cut just as the grass is coming into bloom, is much liked by all kinds of stock. Two or three cuttings may be made during the season. The extensively creeping root stocks are fleshy and tender, and hogs are fond of them. These roots literally fill the ground near the surface, and every joint is capable of developing a new stem.

This grass, when once established, is exceeding difficult to eradicate, and so has come to be greatly feared by many farmers

in the southern part of the state. Unless one wishes to make a permanent grass plot, and give it up to this grass, its introduction will be of doubtful economy as it is hard to prevent its spreading, by means of its powerful and rapidly growing roots.

This species has been introduced into the state and is becoming common, except where it is frozen out by hard winters. Land to be reclaimed from this grass should not be disced as this cuts up the root stock and spreads it more rapidly, better to plow deeply and turn in the hogs, or rake off and burn the roots and stems.

PASPALUM MUCRONATUM.

Muhl.

Water Paspalum.

An aquatic perennial, with much branched, ascending culms from a creeping or floating base one-half to three feet long, and bearing long spikelets in two rows, elliptic in form. Found from July to October, in Southern Illinois.

Owing to its aquatic habit it is of no agricultural value.

PASPALUM MEMBRANACEUM

Walt.

Walter's Paspalum.

A low, creeping, semi-aquatic grass, with much-branched, smooth stems six to eighteen inches long, with short flat leaves, and two to six small racemes one-half to two inches long. Leaf blades one-half to two inches long and smooth.

Period of growth, July to October.

Found in wet soil, and of no agricultural value.

the following day.

On the 2nd day I will be in

the following morning

to start working on the following night

and continue until the next day.

On the 3rd day I will be in

the following morning

to start working on the following night

and continue until the next day.

On the 4th day I will be in

the following morning

to start working on the following night

and continue until the next day.

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to start working on the following night

and continue until the next day.

On the 8th day I will be in

the following morning

to start working on the following night

PASPALUM LAEVE.

Mich.

Field Paspalum.

A perennial grass with ascending culms from one to three feet high, with smooth leaves and stem. The leaves are from three to twelve inches long, alternate along stem.

This grass has some value owing to its lateness of growth,, extending in favorable seasons to October. Being a late summer grass when pastures are bare, it is well liked by stock. As it usually grows in open fields and meadows where the ground is moist, it secures more moisture than the native forms growing upon higher ground.

In cultivated grounds, however, and especially upon lawns, which it may invade, it must be classed as a weed and so can not be recommended for sowing as a hay crop.

PASPALUM SETACEUM.

Mich.

Slender Paspalum.

A slender, erect, sometimes decumbent perennial grass, from one to three feet high; leaves two to six inches long, sheaths generally hairy; spikes slender, the terminal one mostly solitary on a long peduncle, the lateral ones protruding from the sheaths of the upper leaves, spikelets in two rows. Period of growth from April to October. Found in dry fields and sandy places. It is of no economic value and may become troublesome when once introduced. Stock do not care for it owing to its hairy leaves.

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SYNTHERISMA FILIFORMIS.

(L.) Nash.

Slender finger grass. Crab grass.

Culms slender, erect, one to two feet tall. Simple or sparingly branched, arising from annual roots. Spikes two to eight inches long, erect, or somewhat spreading, bearing the spikelets in pairs or alternately. Leaves from three to ten inches long and one-eighth to one-fourth inches wide; lower sheaths hairy. Found in dry sandy soil. Fruitage from July to September. Of no agricultural value.

SYNTHERISMA VILLOSA.

Walt.

Southern slender finger grass.

Culms densely tufted, two to four feet tall. Lower sheaths hairy. Leaves from three to eight inches in length, one-fourth inch wide; racemes two to eight, usually more than four, from two to eight inches in length, erect or ascending; spikelets short, acute, usually in 3's. Period of fruitage from June to October. Found in sandy soil along streams. Of little or no value to agriculture.

SYNTHERISMA LINEARIS.

(Krock) Nash

Small crab grass.

Culms eight to twenty inches in height, finally prostrate, forming large mat like growths. Sheaths smooth. Leaves from two to five inches long, one-fourth to one-half inch wide, smooth on both sides; racemes from one to three inches long, finally widely spreading; spikelets short, very narrow, acute, usually in pairs.

1. *Leucosia* *leucostoma* *leucostoma* *leucostoma*

This is a slender annual grass, the stems much branched from the root stock and containing little foliage. Period of fruitage from July to September. It is found both in cultivated fields and waste places. Coming at a time in the fall when other grasses are scarce, this grass might have some economic value, were it not for its wiry stems and sparse foliage. It is of no value to agriculture.

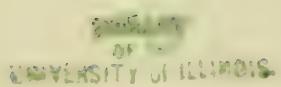


SYNTHERISMA SANGUINALIS.

(L.) Dulac.

Large Crab Grass.

This is a well known annual grass familiar to most all people who have to do with soil in any form whether lawn or field.



In gardens it becomes a noxious weed. In cultivated fields it is one of the most persistent weeds, requiring much labor to subdue. It varies in height according to the soil in which it is growing, in poor soil height varies from two to three feet, while in exceedingly rich soils it has been grown to four feet. It frequently springs up in grain fields, after harvest, in such quantities as to yield quite a crop of hay. This grass will make good pasture and usually is readily eaten by cattle.

The stems are not wiry and contain little fibre, and dry readily when cut, but care must be taken in curing the hay for a wetting either by rain or heavy dew destroys its value and renders it unpalatable.

In the southern states it frequently yields two cuttings of hay from fallow ground.

In the north it is not to be recommended for cultivation.

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ECHINOCHLOA CRUS-GALLI.

(L.) Beauv.

(*Panicum crus-galli*)

Barn yard grass.

This is an annual grass and familiar to most all. It is of a rank growth and common in cultivated ground, especially if the soil is rich. It can usually be found around dwellings and home gardens.

The form growing in Illinois is one of the worst weeds, and requires persistent efforts to prevent its seeding, and so spreading. Being annual it can be eradicated by this method. Several varieties of this species have been cultivated in the south and yield a fair hay crop, or used for green forage. In Illinois, however, it is ranked as a weed, and causes considerable trouble in hay fields in some localities. The heads are large and bristly, and

stock dislike them when found in the hay.

Owing to the lateness of growth of this grass it is a serious pest in laid by crops, and consequently escapes destruction. To eradicate we must prevent the seed from ripening and frequently this requires hand cultivation after crops are too large to use weeder or cultivator.

ECHINOCHLOA WALTERI.

(Pursh.) Nash.

Salt marsh grass.

Grows in marshes and ditches, and to height of from three to six feet, with leaves about a foot long. It is of no economic value to our farmers. As it grows in unused places it can not be classed among the weed of the agriculturist.

Period of fruitage from August to October.

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PANICUM CAPILLARE.

L.

Old Witch grass.

This is an annual grass, sometimes called tickle-grass, or tumble weed owing to its spreading plume like tops or panicles breaking off and being blown across the fields by the winds. In this way much of the seed is distributed.

The plant grows from one to two feet in height, the stems simple, or sparingly branched. The top or panicle varies from eight to fourteen inches in length.

It is found in dry soil, and cultivated fields, and when once introduced into these places, it is almost impossible to eradicate. Being an annual, it must be prevented from maturing its seeds by cutting and removal, or by burning.

PANICUM PHILADELPHICUM.

Bernh.

Wood Panicum.

Culms erect, or occasionally decumbent, eight to twenty-four inches long, slender, somewhat branched at the base. Sheaths with coarse stiff hairs. Leaves two to four inches long, narrow, erect, more or less hairy. Panicle four to eight inches long, its lower branches spreading or ascending. Spikelets small, smooth, borne in pairs. Period of fruitage, August and September.

This grass is one of the smaller forms, its height being restricted by the amount of shade. It is usually found in dry woods and thickets, along the sunny margins of which it frequently reaches a height of two feet.

It has little value and it being restricted to shady places will not become a weed.

PANICUM FLEXILE.

(Gattinger) Scrib.

Wiry Panicum.

Culms few, erect, six to eighteen inches tall, slender, bearded at the nodes. Sheaths rough hairy; leaves four to ten inches long, one-eighth to one-fourth inch wide, erect, acuminate, more or less hairy; foliage sparse, panicle four to eight inches long, narrow, its branches ascending, spikelets shorter than the pedicels.

Period of fruitage, August to October.

This grass grows in both dry and slightly moist soil. Is of little value to the farmer. It does not spread rapidly and is not likely to become a weed.

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PANICUM PROLIFERUM.

Lam.

Spreading Panicum; Sprouting Crab Grass.

A smooth and usually much branched native annual grass, from one to two feet in height, with rather coarse stems and leaves. Usually found in low grounds and ditches where there is moist soil. Season of growth is from March to October.

This grass is a decided weed in Illinois' cultivated fields. Owing to its forming a large number of heads from one root stock, it spreads rapidly, and is only eradicated by preventing the seed from forming. If plants are removed by tillage it is best to do so before heads form, or late tillage to destroy them by their failing to take root again.

This grass is frequently found growing with crab grass. In the southern states this is often cut with the crab grass for the

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poor man's hay as it is called.

PANICUM COGNATUM.

Schultes.

Diffuse Panicum.

A slender perennial grass with erect culms, sometimes prostrate, twelve to twenty-four inches tall, generally much branched at the base. Lower sheaths sometimes hairy; leaves scarce, one to four inches long, one-eighth to one-fourth inches wide, ascending, acuminate, smooth. Panicle four to twelve inches long, bearded in the axils, the lower branches spreading when mature. Spikelets lance shaped, short, pointed, shorter than the pedicels.

Period of fruitage from July to September. Found in dry soil, but so far has not become obnoxious. It has no value and must be classed with the weeds where it interferes with cultivation.

PANICUM VIRGATUM.

L.

Switch Grass.

Culms erect and unbranched, growing from a creeping, perennial root stock, and growing from three to five feet high. Leaves about one foot long, flat and smooth. Period of fruitage in August and September.

This grass is found in both moist and dry soil, in many situations, but grows most luxuriantly in rich native sod. It is used for both hay and pasturage, but is more valuable for hay. When intended for hay, should be cut while in bloom, or before seeds ripen. This grass ^X highly spoken of in South Dakota and Iowa, as a valuable native grass.

the following year, and the following year

PANICUM AGROSTOIDES.

Spring.

Red-Top *Panicum*.

A native annual with flattened, leafy stems, two to four feet high, and a panicle or top resembling red top. It grows in low meadows and along banks of creeks, shores of ponds and moist places. Period of fruitage is from July to September.

This grass is of some economic value, as it often yields a large amount of very good native hay. In low, moist, and rather rich meadows its cultivation would doubtless be valuable.

PANICUM ROSTRATUM.

Muhl.

Beaked *Panicum*.

Culms arise from a creeping, scaly, branched root stock, and vary from one and one-half feet to five feet, much branched and smooth.

The leaves about one foot long. Grows in moist soil in low woods and thickets, marshes and along banks of streams. Its period of fruitage is from July to October. This grass, owing to its period of growth, may be of value in late autumn, but generally the luxuriant growing grasses along streams are rather tough and wiry and not palatable to cattle, unless when quite young.

PANICUM DEPAUPERATUM.

Muhl.

Starved *Panicum*.

A slender erect, or ascending perennial, usually much branched near the base, six to sixteen inches high, with very narrow erect leaves, three to eight inches long, few flowered narrow

panicles, several inches in length. Found in open woodlands and gravelly fields from May to August. Of little value to agriculture.

PANICUM DICHOTOMUM.

L.

Panic Grass.

A slender, erect, glabrous, and finally much branched above, somewhat wiry perennial, six inches to two feet high, with pale green, spreading leaves, one to three inches long, and open panicles one to four inches long. Found from May to October in dry thickets, open woodlands and plains, and of little or no agricultural value.

PANICUM BARBULATUM.

Mich.

Barbed Panicum.

Culms at first simple, erect, two to three feet tall, later profusely branched for their whole length; later three to four feet long, prostrate or leaning, the nodes strongly barbed, sheaths smooth. Leaves smooth, upper spreading, lower usually reflexed. Primary panicles ovoid in form, its branches ascending, rigid, secondary panicles smaller, lax, the branches bearing few spikelets. Spikelets ellipsoid, purple, glabrous. Found in moist soil from June to August. Of little value to agriculture.

PANICUM NITIDUM.

Lam.

Shining Panicum.

A smooth, erect, finally much branched perennial. Culms from twelve to eighteen inches in height, later in period reaches a

1. *What is the relationship between the two main characters?*

length of from three to four feet, and heavily branched. Fruitage from June to August. Common in moist sandy soil and wet grounds, and of no economic value, but not sufficient in numbers to become obnoxious.

PANICUM UNCIPHYLLUM.

Trin.

Hairy Panicum.

Culms at first erect and simple, but later becomes profusely branched, sometimes bending over with the weight of the top. Stems and leaves hairy. Leaves from two to four inches long, generally spreading in form. Primary panicles from two to three inches long with upright branches; lateral panicles smaller; spikelets one-eighth inch in length, generally hairy. Period of fruitage from June to August.

Found in dry places, and uncultivated fields. This grass is disliked by cattle, owing to its hairy leaves.

PANICUM TENNESSEENSE.

Ashe.

Tennessee panic grass.

Culms tufted, sixteen to twenty-four inches tall, rather weak and ascending with long spreading hairs, leaves ascending, lanceolate, the lower surface softly pubescent, the upper surface with scattered long hairs. The leaves, on branches much shorter and spreading, and upper surface nearly smooth. Panicle branches ascending, strongly pubescent, with long spreading hairs.

Found in woods and shady places from July to September.

COLLECTED STORIES

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PANICUM LEIBERGII.

(Vasey) Scrib.

Lieberg's Panicum.

A slender, erect or ascending perennial, one to two feet high with rather broad, flat leaves and few flowered panicles of large spikelets. Culms strongly scabrous, finally much branched. Leaf blades rough in the lower surface.

Period of fruitage June to July. Found in both dry and moist soil, and open woodlands. Of only slight value.

PANICUM SCRIBNERIANUM.

Nash.

Scribner's Panicum.

An erect and finally branching perennial, six to twenty-four inches high, with usually more or less spreading flat leaves which are smooth beneath. Panicles ovoid, three-fourths to one and one-half inches long.

Found from May to September in both dry and moist soils. Of little or no agricultural value, and not likely to become injurious.

PANICUM XANTHOPHYSUM.

Gray.

Slender Panicum.

A slender or occasionally rather stout, erect perennial, one to two feet high, sparingly branching near the base with broadly lanceolate leaves two and one-half to six inches long, and simple, few flowered racemose panicles, one to four inches long. Period of growth, June to September.

Found in dry sandy soil. Of little agricultural value.

PANICUM POLYANTHES.

Schultes.

Small-fruited Panicum.

A rather stout, erect, and finally sparingly branched, glabrous perennial, one to two and one-half feet high, with broad, spreading leaves; many flowered panicles, three to seven inches long. Found in dry, open woodlands and occasionally in open grounds from June to October.

Of little agricultural value.

PANICUM PUBIFOLIUM.

Nash.

Hairy-leaved Panic-grass.

A tufted, softly pubescent perennial. Culms twelve to twenty-eight inches tall, the nodes densely barbed; sheaths densely pubescent, leaves spreading or ascending, hairy on both sides. Upper leaves broad, lower smaller. Primary panicle branches covered with short soft spreading hairs. Found in rocky woods and shady places from June to September.

Owing to its hairy leaves it is not readily eaten by cattle.

PANICUM MACROCARPON.

Le Conte.

Large-fruited Panicum.

Culms one to three feet tall, erect, simple or somewhat branched above, smooth, the nodes, at least the upper ones naked. Sheaths smooth. Leaves from three to eight inches long, clasping stem at base. Panicles small, branches ascending. Found on dry hillsides and places in July and August.

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Furnishes slight picking to animals.

PANICUM PORTERIANUM.

Nash.

Porter's Panicum.

Culms erect, twelve to twenty-four inches tall, simple or somewhat dicotomously branched above, the nodes densely barbed. Sheaths generally softly pubescent; leaves ovate to broadly lanceolate. Panicle branches spreading or ascending. Found in woods and shady places from June to August. Of little value to agriculture.

PANICUM CLANDESTINUM.

L.

Hispid Panicum.

A stout, erect, or ascending perennial, finally branching above, two to four feet high, with broad leaves and terminal diffuse panicles, three to five inches long. On the branches the shorter leaves are more rigid and crowded.

Found in low thickets and open places from May to September.

Of only slight agricultural value.

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CHAETOCLOA GLAUCA.

(L.) Scribn.

Yellow Foxtail.

Culms erect, from an annual root, simple or branched at the base, one and one-half to two and one-half feet high, leaves flat, long, roughish or nearly smooth; spike or head erect, rigid, cylindrical, two to four inches long, tawny yellow in color, covered with bristles.

An introduced species found all over the state in waste places and cultivated fields, and has become one of our troublesome weeds. Period of fruitage is from July to September.

A favorite place for its growth is in the corn fields after the last cultivation, and in this manner escapes eradication.

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It affords a small amount of picking for cattle turned into the stalks or stubble. Although this grass is an annual, it produces so many seeds and is such a vigorous grower, that it is difficult to rid a field when once started. Care should be taken in buying seed of grasses, this weed is found mixed with. Timothy and millet are frequently adulterated with it. The eradication is only accomplished by preventing the seeds from forming.

CHAETOCLOA VERTICILLATA.

(L.) Scribn.

Bristly Foxtail.

Culms erect, from annual roots, one to three feet high, somewhat branched below. This species is much less common than either the green or yellow foxtail grasses. Has little value as a forage plant, and not plentiful enough as yet to annoy as a weed. The foxtails, however, bearing a large quantity of seed spread quite rapidly and it is best to prevent their getting a foot hold, if possible.

CHAETOCLOA VIRIDIS.

Green Fox-tail.

Culms erect from an annual root, with very few branches and from six inches to three feet in height. Fruiting period from July to September. This is one of our introduced weedy grasses and is found everywhere in the fields and waste places. In some localities it is cut for hay. If properly cut and cured it will make good hay, but the yield is so much lighter than millet that the latter is by far preferable. On the whole it is hardly worth

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the cultivation and had better be regarded as a very bad weed. When once established it is almost impossible to eradicate. Its removal can only be accomplished by preventing the seed from forming.

CHAETOCLOA ITALICA.

(L.) Scribn.

Italian millet.

Culms erect, from annual roots, unbranched, from one to four feet in height, with long, broad, rough leaves. The top bearing the seed is a spike and varies from two inches in the wild forms to eight and ten inches in the cultivated.

This grass was introduced into the state and has now escaped from cultivation and is found wild in many localities.

As a cultivated annual it is one of our most useful plants.

ZIZANIA AQUATICA.

L.

Wild Rice.

Culms from three to ten feet high, growing from coarse, annual roots, the leaves being large and from eighteen inches to three feet in length, frequently one-half inch wide. Fruitage from June to October.

This grass is common in different localities throughout the state. It grows best in shallow water along margins of streams.

It furnishes a slender grain about a half inch in length, and is a favorite food for water fowl of all kinds. Cattle and horses eat the grass when tender, but owing to its place of growth is not accessible to many cattle.

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It is hardly of economic importance, but having some value must be included among those of economic value rather than with the weeds.



CENCHRUS TRIBULOIDES.

L.

Bur Grass.

One of our worst annual weeds but fortunately confined to the sandy areas. The stems are branched, about one foot high, the spikes well armed with many pointed, rigid burs, enclosing the seeds. This bur when mature drops, or becomes attached to anything that touches it and carries the seeds with it.

The sharp points or spines of the burs are hard and stiff and break off easily and cause irritating wounds. This weed is very plentiful along the shores of Lake Michigan and on the sand dunes along the Illinois river near Havanna and in the southern part of the state.

Being an annual weed, it is possible to prevent seeds from forming, by removing plants before seeding or by burning over the dead grass and seeds.

HOMALOCENCHRUS ORYZOIDES.

(L.) Poll.

Rice Cut-grass.

A rather stout, rough, and much branched perennial, two to four feet high, with open pale-green or straw-colored panicles five to ten inches long. Within the lower sheaths are found small fruiting spikelets. Found along streams and ditches and in open marshes from August to October. Of slight agricultural value.

HOMALOCENCHRUS VIRGINICUS.

(Willd.) Britton.

Virginia Cut Grass. White Grass.

Culms slender, smooth, usually decumbent, from one to four feet in length. Branched below from a stout root stock, with fine fibrous roots. Fruitage from beginning of August to latter part of September.

This species grows only in swamps or wet woods, the leaves and stems are palatable when young and furnish some forage for the animals that can get through the wet places.

Its short period of growth, however, does not furnish

much food. Being of some value, we class this species among those of economic importance. It can hardly be classed with the more important grasses, which are capable of being cultivated, and yielding annual crops of hay.

HOMALOCEENCHRUS LENTICULARIS.

(Mich.) Scribn.

Catch-fly grass.

Culms erect, slightly branched or simple, from two to four feet tall. Leaves four to twelve inches long. Period of fruitage from July to September. Panicle four to eight inches long, its branches lax and later spreading.

Found in wet places and along streams. Of no economic value.

PHALARIS CANARIENSIS.

L.

Canary grass.

Annual, culms roughened, from one to three feet tall, erect or simply branched. The seed is commonly used for canary feeding. Fruitage from July to August.

This plant has been introduced into the state and is now growing wild in waste places around dwellings in vicinities of towns. It is of little value for hay, but has been cultivated for the seed.



PHALARIS ARUNDINACEA.

L.

Reed Canary Grass.

Perennial, culms stout, erect, and from two to five feet in height, smooth and arising from strong, creeping root stalks. Leaves from three to ten inches in length, and about one-half inch in width. Fruiting period from July to latter part of August.

Found in moist or wet soil in various parts of the state. It is one of the best of the native grasses as far as yield is concerned, and in low meadows yields a fair crop of hay. Stock will eat it quite readily, and if it is cut before the stems become woody, will make palatable hay.

This plant does not attain its full size until the second

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year, and if designed for hay should be cut before flowering, for when mature the stems become too hard and woody to make good fodder.

The seed matures in July and August and is easily gathered.

SAVASTANA ODORATA.

(L.) Scribn.

Holy Grass. Seneca Grass.

This plant is a slender, sweet-scented perennial, one to two feet high, with short leaves.

Found in moist meadows and woods, growing from long creeping underground root stocks, from which spring the flowering culms and numerous long leafed flowerless shoots.

The sweet odor of this grass is its attractive feature, and somewhat resembles that of the sweet vernal grass, found in cultivation.

This grass makes a good turf, owing to its underground roots spreading so widely, but is of no value for forage. It is generally true that the strong scented grasses are frequently rejected by cattle. Period of fruitage is in June and July.

This form is not yet plentiful in the state and may not become obnoxious.

ARISTIDA DICHOTOMA.

Michx.

Poverty Grass.

A much branched, slender, annual grass, from six to eighteen inches in height, commonly found in dry, sterile fields and open places, and hence its name "Poverty Grass".

Its fruiting period is in August and September. It is

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of no economic value and likely to become obnoxious as a weed.

ARISTIDA BASIRAMEA.

Engelm.

Forked Aristida.

Similar in height to Poverty Grass, from six to eighteen inches, stems smooth, erect and much branched. Fruitage in July to September.

Found in dry fields and open places. Of no value and classed as a weed.

ARISTIDA RAMOSISSIMA.

Engelm.

Branched Aristida.

Culms smooth and from six inches to two feet in height, erect, slender and branched. Leaves few, and one and one-half to three inches in length.

Found in dry places over the state. Of no value to farmers as the leaves are very short and stems woody. Not of sufficient importance to be classed as obnoxious.

Fruiting period from July to September.

ARISTIDA STRICTA.

Michx.

Erect Aristida.

A rigid, erect, wiry perennial grass, from two to four feet tall. Leaves from eight to twelve inches in length. Fruiting period from July to September.

Found in dry places, and is of some value in poor pastures. In the southern states forms a good deal of the pasturage, and is

SCOTTISH CHAMOIS

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SCOTTISH CHAMOIS

a grass of considerable economic value.

In Illinois it is not to be considered in comparison with our native blue grass pastures.

ARISTIDA GRACILIS.

Ell.

Slender Aristida.

Culms smooth, from six inches to two feet tall, simple or branched. Leaves from one to four inches in length. Fruitage in August and September.

Found in dry places, especially if not cultivated for some time.

ARISTIDA PURPURASCENS.

Poir.

Purplish Aristida.

Culms twelve to thirty inches tall, leaves from four to eight inches long, narrow, flat, or becoming involute in drying. Spike like panicles, six to sixteen inches long, strict or sometimes nodding, some of the scales of each spikelet awn pointed. Period of fruitage in September and October. Found in dry places and of little or no value.

ARISTIDA TUBERCULOSA.

Nutt.

Sea-beach Aristida.

A rigid, much branched perennial, twelve to eighteen inches high, with nearly simple panicles, four to seven inches long; branches erect, rather distant, the lower in pairs, one short and few-flowered, the other elongated and many-flowered.

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Found in dry sandy soil, along streams and bodies of water, from August to October.

This species is classed among the weeds.



ARISTIDA OLIGANTHA.

Michx.

Few Flowered Aristida.

Culms smooth, one to two feet in height, erect, slender and slightly branched, leaves from one to six inches in length. Fruiting period from August to September.

Found in dry soil and of little value.

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STIPA SPARTEA.

Trin.

Porcupine Grass.

A stout, erect, perennial grass, with simple culms, from two to four feet tall. Basal leaves, one-third to one-half as long as the culms, both the basal leaves and those of the culms very narrow.

Panicle from four to ten inches in length, with erect branches; outer scales of spikelets acuminate into a long slender point. Awn, four to eight inches in length, stout, usually twice bent, tightly spiral below, double spiral about the middle. Found on prairies and along railroads. Fruitage from June to August.

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This grass furnishes fair forage on the prairies, but the main objection is the sharp and bearded callus of the seeds, which renders them dangerous to cattle, especially sheep, as they attach themselves to the wool and sometimes penetrate the flesh, causing serious injury.

ORYZOPSIS MELANOCARPA.

Muhl.

Black Mountain Rice.

Culms upright, rough, from two to three feet in height, leafy. Roots perennial. The leaves are broad and flat, eight to twelve inches long, with a long tapering point. Period of fruitage in July and August.

Found only in rocky woods in one or two localities in the state. Considered of little or no value as a forage plant.

MILLIUM EFFUSUM.

L.

Tall Millet-grass.

Culms four to six feet tall, erect, simple, smooth throughout. Leaves narrowed toward the base, acuminate, smooth.

Panicle short, lax, its branches long, slender, flexuous, naked at the base, and dividing above the middle, at length widely spreading. Scales of spikelets smooth. Period of fruitage, June and July.

This is a fine growing woodland grass of some agricultural value, but is not widely distributed.

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MUHLENBERGIA MEXICANA.

(L.) Trin.

Meadow Muhlenbergia. Mexican Drop Seed.

Culms erect, sometimes spreading and ascending, much branched, two to three and one-half feet high, arising from short scaly, creeping root stocks. Perennial, leaves short and narrow. Period of fruitage from beginning of August until latter part of September. Quite common throughout the state.

Found in dry, open woods and moist shady places. It will never interfere with cultivation, as it will not grow in dry places.

It is of some agricultural value as a native hay grass in low meadows. It is of more value as a soil binder in preventing banks of soil from washing down, where there are overflows.

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MUHLENBERGIA DIFFUSA.

Willd.

Nimble Will. Dropseed Grass.

Culms smooth, from one to two feet long, decumbent, or often prostrate or creeping and ascending, very slender and properly branched. Period of fruitage in August and September.

A low slender diffusely branched grass growing on dry hills, in woods, and especially in shady waste grounds about dwellings. The leafy, wiry stems, which spring from extensively creeping and rather tough rhizomes, which make a turf very difficult to break up. When young this grass is readily eaten by all kinds of stock, but after it matures it is so tough that few animals eat it.

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It possesses very little agricultural value, and in most localities is looked upon as a weed. This grass is a nuisance in meadows, as the tough wiry stems are extremely hard to cut with a mower.

Cultivation and rotation with clover may be successfully used in dealing with this grass.

MUHLENBERGIA SOBOLIFERA.

(Muhl.) Trin.

Rock Muhlenbergia.

Culms smooth, from two to three feet tall, erect sometimes sparingly branched above. Leaves from four to six inches in length. Period of fruitage, September and October.

Found in open rocky woods. Not plentiful in the state and of little or no agricultural value.

MUHLENBERGIA RACEMOSA.

(Michx.) B.S.P.

Marsh Muhlenbergia. Wild Timothy.

Culms upright, two to three feet high, stiff, more or less branched, from perennial roots and hard, knotty, creeping root stocks. Very leafy, leaves narrow and from one to six inches long.

Not very plentiful in the state. Grows in moist places, and is quite valuable as a native forage plant. If cut while in blossom will yield a fair quality of hay. If let stand too long, the stems become woody and unpalatable. Period of fruitage is in August and September, and it should be cut before that time.

In South Dakota plats of this grass have been cultivated and seem to have given good results.

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MUHLENBERGIA SYLVATICA.

Torr.

Wood Grass.

A perennial grass of somewhat decumbent habit, two to three feet high, very much branched, from scaly, creeping root stocks. The culm has numerous short joints below, which are frequently bent, and rooting near the base, and sending out many long, slender, leafy, lateral branches, which give rise from the points and at the apex to the flowering panicles.

Leaves, three to four inches long and two to three lines wide, gradually pointed. The panicles are narrow, usually two or three inches long, and composed of five to ten spike like branches.

This grass is frequently found in moist woods and low meadows, or in prairie bogs. It is of little value for upland culture, but thrives best in bottoms, where it grows freely. It is slower in maturing than most grasses, and hence fills the place caused by the dying out of the earlier grasses. It is eaten with avidity by cattle, and is a good grass in its place.

MUHLENBERGIA TENUIFLORA.

(Willd.) B. S.P.

Slender Flowered Drop Seed.

Culms smooth, from two to three feet tall, erect, simple or sparingly branched, perennial, arising from a creeping, scaly root stock. Period of fruitage, August and September.

Found in rocky woods and thickets, and quite common. It is of little or no agricultural value.

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BRACHYELYTRUM ERECTUM.

(Schreb.) Beauv.

Brachyelytrum.

A perennial grass with simple culms, from one to three feet high, leaves from three to six inches long. Period of fruitage, July and August.

Grows in moist places and open rocky woods. Of no agricultural value.

PHLEUM PRATENSE.

L.

Timothy.

An introduced species which has escaped from cultivation and is now widely distributed and needs no description. This species has been cultivated nearly one hundred and fifty years and is still recognized as the principle hay grass. Timothy being a shallow rooting grass, draws most of its nourishment from the surface, leaving the sub-soil untouched. The best method to keep a good stand of timothy, is to give the field a top dressing of manure, well distributed, during the fall or winter, when most convenient.

ALOPECURUS GENICULATUS.

L.

Marsh Foxtail.

An introduced perennial species with culms decumbent and branched at the base, then ascending, from six inches to two feet in height. Leaves flat and spreading.

Grows from April to September, and is found in wet meadows, and along banks of streams and ditches. This species furnishes pasture in these situations, and affords excellent grazing, being

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tender and nutritious.



ALOPECURUS PRATENSIS.

L.

Meadow Foxtail.

An erect, smooth perennial grass introduced into the state, and now growing wild in many places. Grows from one to three feet tall, with short creeping root stocks, and flat spreading leaves. Season of growth is in June and July.

This is a valuable grass for moist meadows and pastures,

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especially the latter, on account of its early growth. On good soil will give a good yield of excellent forage. It should enter into all mixtures for permanent pastures, because it is very lasting, highly nutritious and earlier than most species. Should never be sown by itself, but always be mixed with other grasses, as it gives a full yield only in the second and third year.

SPOROBOLUS ASPER.

(*Michx.*) *Kunth.*

Rough Rush Grass. Prairie Grass.

A rather slender perennial, one to four feet high, with long leaf blades. Period of fruitage is from August to October. Found in dry sandy situations as in open woods and glades. Stock will eat it when young and tender, but later will avoid it. Of little agricultural value.

SPOROBOLUS LONGIFOLIUS.

(*Torr.*) *Wood.*

Long-leaved Rush Grass.

A stout perennial grass, one to three feet high, with long pointed leaves. Period of fruitage from August to October. Found in dry sandy soil, but not widely distributed in this state. Of no agricultural value.

SPOROBOLUS VAGINAEFLORUS

(*Torr.*) *Wood.*

Sheathed Rush Grass.

Culms slender, ascending, more or less bent below, branching, six to eighteen inches high, smooth, usually purplish above the sheaths, from annual fibrous roots, leaves short, long pointed.

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Fruitage period, August and September.

It thrives best on rather dry soils, and is found along roadsides and in waste places. This species is sometimes called Poverty Grass, probably owing to its sparse foliage and habit of growth.

Of no agricultural value whatever, and in some places becoming troublesome as a weed.

SPOROBOLUS NEGLECTUS.

Nash.

Small Ruch Grass.

Culms from six to twelve inches tall, erect, from a usually decumbent base, slender, often much branched, and smooth. Leaves short and narrow. Found in August and September.

Of no economic value. Usually found only in dry soils.

SPOROBOLUS VIRGINICUS.

(L.) Kunth.

Sea Shore Rush Grass.

Culms six inches to two feet tall, erect or sometimes decumbent, simple or branched at the base, smooth. Leaves from one to eight inches long and quite narrow. Fruitage in August and September. Found in sandy places, along streams and dunes.

Of no agricultural value.

SPOROBOLUS EJUNCIDUS.

Nash.

Purple Dropseed Grass.

Culms smooth throughout, from one to two feet tall, tufted, erect, slender, simple. Leaves from base from six inches

1881-1882

to one foot long, those upon the stem shorter, one to three inches.

Period of fruitage, August and September. Found in dry sandy soil and inclined to be weedy in our state.

Of little or no agricultural value.



SPOROBOLUS CRYPTANDRUS.

(Torr) Gray.

Sand Drop-seed. Prairie Grass.

Culms one and one-half to three and one-half feet tall, erect, simple or sometimes branched at the base and smooth. Leaves

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three to six inches long. Period of fruitage from August to October.

Found in dry, sandy, or gravelly soil. It is a strong rooted perennial grass, inclined to be wiry, but forms considerable of the wild forage grass. Stock eat it when young and tender and hence is of some value as a native grass. In some parts of the United States it is one of the important forage plants.

SPOROBOLUS HETEROLEPIS.

Gray.

Northern Drop Seed. Bunch Grass.

This species is found in wild meadows. The grass is from two to four feet high and produces a large number of long slender leaves close to the ground. The stems are wiry and arise from a mass of strong, fibrous, perennial roots. Having a tendency to grow in bunches, it is often called bunch grass. It yields a fair quality of hay when properly cut and dried. The odor is somewhat similar to stink grass, but not enough so as to render it disagreeable to cattle.

This is one of the important native grasses.

CINNA ARUNDINACEA.

L.

Wood Reed-grass.

A tall, leafy perennial from three to seven feet high, with simple culms and flat leaf blades. Period of fruitage in August and September.

This species is found in shaded swamps, moist woods, and along streams, it is a good grass for low wet lands subject to overflow. If properly cared for in these localities, will yield a

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large amount of good hay.

CINNA LATIFOLIA.

(Trev.) Guset.

Slender Wood Reed-grass.

Culms two to four feet tall, erect, usually slender and simple. Leaves four to ten inches long. Period of fruitage, August and September.

Found in damp woods and moist swampy places. Of some value for hay in these situations, but of less value than the other species, Wood Reed-grass.

AGROSTIS ALBA.

L.

Red Top. Fiorino. Herd's Grass.

Culms eight inches to two and one-half feet tall, erect or decumbent at the base. Leaves two to eight inches long. Period of fruitage from July to September.

A very variable perennial species introduced into the state, and having escaped from cultivation is now found wild in many places. It is valuable as a pasture grass in low, moist meadows, as it is quite hardy and endures close pasturing. Its vigorous underground root stocks enable it to thrive when other grasses would be killed by drought.

It starts rather late in spring or after cutting, affording very good pasture, remaining green a good part of the year. The hay when properly cut and cured is of the finest quality. Chemical analysis shows it to rank next to June grass, in nutritive qualities.

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AGROSTIS PERENNANS.

(Walt.) Tuck.

Thin Grass.

Culms one to two and one-half feet long, from a decumbent base, weak, slender, and sometimes branched above. Leaves from two to six inches in length. Panicle four to eight inches in length, open, the branches spreading. Period of fruitage, July to September.

This species occurs in woodlands and is common in moist, shady places. Though widely distributed, it is of little value for forage purposes, as it produces so scantily, the stems being thin and wiry and the leaves short and thin.

AGROSTIS HYEMALIS.

(Walt.) B.S.P.

Rough Hair Grass.

Culms slender, erect and tufted, from one to two feet high, arising from fibrous roots. Leaves short and narrow. Period of fruitage, July and August. This is a well known grass, quite commonly distributed over the state, and growing mostly in dry places.

Owing to its scant foliage and slender stems, this grass is of little agricultural value, it being better to regard it as one of the grassy weeds. The large branched panicles or heads break away soon after the seeds mature and are blown about by the wind, and in this way disseminating its seeds.

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CALAMAGROSTIS CANADENSIS.

(Michx.) Beauv.

Blue Joint Grass.

This is one of our best native grasses. The culms are quite leafy and from three to five feet high, and the open brown or purplish panicles or heads somewhat resemble Red Top.

Occasionally it is found occupying considerable areas to the exclusion of other grasses, and under such conditions yields a large amount of excellent hay, which is readily eaten by stock. This grass grows naturally on low, moist meadows, and wherever tried carefully, has succeeded under cultivation. The period of fruitage is from July to September.

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HOLCUS LANATUS.

L.

Velvet Grass. Meadow Soft Grass.

A perennial grass, one to two feet high, with creeping root stock, erect stems and flat leaves. Introduced into the state and now growing wild in fields, meadows and waste places. This grass is not well liked by stock and possesses little nutritive value. It is of some value, however, on peaty or sandy soils, where the better grasses will not grow. Period of fruitage is from July to August. Where other grasses will thrive, its cultivation is not to be recommended. It is entirely unsuited for lawns.

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AMMOPHILA ARENARIA.

(L.) Link.

Sea Sand-reed.

Culms two to four feet tall, erect, rigid and woody, arising from a horizontal, branching, root stock. Perennial. Of no economic value and only found along the Lake Shore near Chicago, and on very sandy areas throughout the state, near large bodies of water. This species is one of the most valuable grasses adapted to binding, shifting, sands, and is cultivated in some localities for that purpose. It also has been used in the manufacture of coarse paper. It is of no value as fodder.

CALAMOVILFA LONGIFOLIA.

(Hook) Hock.

Long Leaved Reed Grass.

A stout, long-leaved grass, one to four feet high, growing in sands or sandy soil along the shores of the lake near Chicago, and sand dunes in central part of state. It has very strong and far reaching underground roots, and this makes it an excellent grass for binding shifting sands, or those subject to washings from overflows or currents. It is of no value for other purposes, however.

TRISETUM PENNSYLVANICUM.

(L.) Beauv.

Marsh False-oat. Marsh Oat-grass.

A slender, erect, loosely tufted, smooth perennial, two to three feet high, with soft, flat leaves, one to six inches in length. Panicle yellowish, narrow, the branches ascending, scales awned. Period of fruitage, June and July.

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This grass is found in wet meadows, along brooks and moist places. Not widely distributed, however. Of no agricultural value.

DANTHONIA SPICATA.

(L.) Beauv.

Common Wild-oat Grass.

A smooth, slender, erect perennial, one to two and one-half feet high, leaves narrow, rough, from four to six inches long. Inflorescence, racemose or paniculate, pedicels and branches erect or ascending. Period of fruitage, July to September.

It grows in dry and sterile soil, frequently in stony places, and its presence is usually indicative of impoverished lands. Occasionally found in neglected fields. It is a grass of no agricultural value.

AVENA SATIVA.

L.

Common Oat.

The common oat has escaped from cultivation in some parts of the state, especially along railroads, and is now growing wild. Spreads but slowly owing to many of the seeds being eaten by birds.

ARRHENATHERUM ELATIUS.

(L.) Beauv.

Tall Oat Grass.

A loosely tufted perennial, two to four feet high, with flat leaves and narrow, loosely flowered panicles, six to eight inches long, glumes unequal, awn twisted. Introduced from Europe as a fodder grass and now widely naturalized.

Found in fields and waste places where it has escaped from

جعفر بن محبث

cultivation. Grows from June to August. If cut at the right time makes good hay.



CAPRIOLA DACTYLON.

(L.) Kuntze.

Bermuda Grass.

A creeping perennial, with upright or ascending leafy, flowering branches, six inches to two feet high, leaf blades one to two inches long.

An introduced species now growing wild. This species is

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one of the most valuable forage grasses for the south and is widely cultivated. It grows freely on poor or sandy soil where other grasses will not thrive and resist extreme drought and high temperatures. In the southern portion of our state this grass is of considerable value. Where other grasses can be grown this grass must be classed as a weed, owing to its persistent nature.

SPARTINA CYNOSUROIDES.

(L.) Willd.

Tall Marsh Grass.

A stout, erect perennial, two to six feet high, with unbranched, smooth culms arising from strong scaly, creeping, root stocks, and long, tough leaf-blades. Period of fruitage from August to October.

Found along river banks, lake shores, and moist places. When cut early this grass makes a fair but coarse hay, and it has been used successfully in the manufacture of twine and paper. The strong creeping root stocks adapt it for binding loose sands and river banks.

SCHEDONNARDUS PANICULATUS.

(Mutt.) Trel.

Wild Crab Grass.

A low, weak spreading grass, six to eighteen inches in height, somewhat leafy below, and arising from annual fibrous roots. Leaves short, narrow. Period of fruitage, July to September.

Found throughout the state, on dry soils, resembles crab grass, but can be distinguished by its general habit of growth, and the panicles or heads being curved and spreading. Furnishes

slight pasturage, but not sufficient to recommend it. It had better be classes with the weeds and be eradicated.

BOUTELOUA HIRSUTA.

Lag.

Hairy Mesquit-grass. Black Grama.

Culms slender, erect, tufted, smooth, six to fifteen inches high, from a mass of long and slender, but tough, fibrous roots. Leaves most plentiful on the lower part of the stem, narrow, flat, and hairy. Period of fruitage, July to September.

Found in the northwestern part of the state, on dry soils; generally on dry, rocky or sandy soils, where few other grasses will grow. It is of some value and furnishes pasturage in slight quantities.

BOUTELOUA OLIGOSTACHYS.

(Nutt.) Torr.

Blue Grama Grass.

A slender perennial, with slender stems, eight to sixteen inches in height, from very tough, fibrous roots and slender root stocks, very leafy below, upper leaves short, lower stem leaves, from three to five inches long. Period of fruitage, July to September.

This is one of the common prairie grasses, growing on the higher knolls, and drier prairie regions. Owing to its short leaves, is of no value for hay, but it furnishes excellent forage, till snow covers it. It stands trampling of stock well, and is one of the best wild grasses for pasturage purposes.

1. *Streptomyces* *luteus* *var. luteus*
2. *Streptomyces* *luteus* *var. luteus*
3. *Streptomyces* *luteus* *var. luteus*
4. *Streptomyces* *luteus* *var. luteus*
5. *Streptomyces* *luteus* *var. luteus*

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7. *Streptomyces*
8. *Streptomyces*



ELEUSINE INDICA...

(L.) Gaertn.

Crow Foot,

Wire Grass, Crab Grass, Yard Grass.

A coarse, tufted annual, with erect or spreading stems, six inches to two feet in height. The stems are somewhat wiry, flattened, many springing from a single root. The leaves are rather thick and from three to twelve inches long. Having been introduced into the state, it is now growing wild in many places, especially in the central and southern portions, south of Henderson and Peoria counties. It is found in cultivated grounds about dwellings, in gardens, etc.

Some authors have spoken of it as being nutritious, and good for grazing or soiling and for hay. This may be true in the southern states where green feed is scarce, but in Illinois it is

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regarded as a weed and often very troublesome in door yards, lawns, and cultivated fields. Period of fruitage, June to September. Being an annual this grass can be eradicated by thorough cultivation and prevention of seeding during the above period.

ATHEROPOGON CURTIPENDULA.

(Michx.) Town.

Tall Grama.

Culms rather stout, erect, one to three feet high, from very tough, perennial, fibrous roots, with short, scaly off-shoots, leafy below. Leaves flat, long and narrow, from two to twelve inches in length. Period of fruitage, July to September. Found on the upland prairies, and may be recognized by the one sided arrangement of the spikes. It is a valuable forage grass when used for hay. Stock eat it as hay, but prefer other grasses in the pasture.

Tall grama grass comes into use as some of the other grasses die out, and so aids in carrying over wild pastures.

DACTYLOCTENIUM AEGYPTIUM.

(L.) Willd.

Egyptian Grass. Crow Foot Grass.

A low, tufted or creeping annual grass, with ascending, flowering stems, six inches to two feet high. Leaves about six inches in length.

Usually found in cultivated fields in the southern part of the state. In some portions of the southern states, has become so abundant as to crowd out other native grasses, and has been cut for hay.

31. Oct 1931 20 10:30

1000' above sea level

at 1000' above sea level

It has little to recommend it, except its persistancy, and we regard it as a weed. Being an annual, cultivate thoroughly, and remove grass before seeding. Period of fruitage, July to October.

LEPTOCHLOA MUCRONATA.

(Michx.) Kunth.

Feather Grass.

A more or less branching annual, two to four feet high, with rather broad, flat leaves and long terminal panicles. Period of fruitage, July to September.

A native species found in both dry and moist, cultivated and waste grounds, principally in the southern portion of the state. It is of no agricultural value, and is classed as a weed. Its eradication can be accomplished by thorough cultivation, and preventing the formation of seeds.

LEPTOCHLOA ATTENUATA.

Nutt.

Sharp Scaled Leptochloa.

Annual grass, culms tufted, from eight to sixteen inches in length, branching at the base, leaves short and narrow. Inflorescence, four to eight inches long, spikes numerous, finally spreading. Of no value, and found only in sandy river bottoms.

PHRAGMITES PHRAGMITES.

(L.) Karst.

Reed.

A tall, stout, perennial grass, five to fifteen feet high, with stout, creeping root stocks, numerous, broad, pointed leaves. Period of fruitage, August to October.

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This species is one of the largest of our native grasses. Common along margins of lakes and rivers, and is valuable for binding the banks of streams subject to washing. The young shoots are eaten by cattle, especially if other grasses are scarce.

In some places the young grass has been cut for hay, but has little to recommend it for such purpose.

TRICUSPIS SESLERIOIDES.

(Michx.) Torr.

Tall Red-top.

A native perennial grass, from two to five feet high. Stems erect, and somewhat flattened, often viscid above. Sheaths below, overlapping and crowded, above usually shorter than the internodes. Leaves from four to twelve inches in length, about one-half inch in width, flat, attenuate into a long tip, smooth beneath, rough above. Panicle four to sixteen inches long, the branches finally ascending or spreading. Spikelets purple. Period of fruitage from July to September.

Found in dry barren fields in the central and southern portions of the state, from Henderson and Peoria counties southward. Of considerable value to agriculture, as it grows in localities where other grasses do poorly.

TRIPLASIS PURPUREA.

(Walt.) Chapin.

Sand Grass.

Culms one to three feet tall, erect, sometimes prostrate or decumbent. Leaves one-half to two and one-half inches long and quite narrow. Panicle short, branches rigid, finally spreading.

Plant acid in nature. Period of fruitage, August and September. Found in sandy places along the shores of Lake Michigan and Illinois River in the central part of the state.

Of no agricultural value.

ERAGROSTIS CAPILLARIS.

(L.) Nees.

Capillary Eragrostis. Lace Grass.

Perennial. Culms eight to eighteen inches tall, erect, slender and sparingly branched at the base. Sheaths glabrous or sparingly hairy, the upper enclosing the base of the panicle.

Leaves four to twelve inches long, one-eighth to one-fourth inches wide, long acuminate, smooth beneath, rough above, sparingly hairy at base. Panicle diffuse, four to sixteen inches long, branches spreading or ascending, spikelets ovate, little flattened. Period of fruitage, August and September.

Found in dry places principally, and of no agricultural value.

ERAGROSTIS FRANKII.

Stend.

Frank's Eragrostis.

Short Stalked Meadow Grass.

A low, native, diffusely branched, annual, six to sixteen inches high, with open, many-flowered panicles. Leaf blades, two to five inches long. Period of fruitage in September and October.

Found in low sandy ground, in open places, mostly in the northern and central portions of the state. Of no agricultural value.



ERAGROSTIS MAJOR.

Horst.

Strong Scented Eragrostis. Stink-grass.

A handsome annual grass introduced from Europe. Varies in height from six inches to two feet. Stems erect, much branched. Leaves two to eight inches long, one-eighth to one-fourth wide. Panicle two to seven inches long, spreading or ascending.

This species has become widely distributed throughout the state and is found in both cultivated and waste grounds. It is becoming one of our weedy grasses, but being annual, careful cultivation and prevention of formation of seeds during August and September, will do much to eradicate it. The fresh grass having a strong odor, is usually avoided by cattle. When cut and dried, much of this odor is lost, but still it can not be recommended as of any agricultural value.

ERAGROSTIS PILOSA.

(L.) Beauv.

Slender Meadow Grass.

Culms slender, upright or more often bent at the lower joints, branching, smooth, six to fourteen inches high, from annual, fibrous roots. Leaves narrow, flat, soft and pointed. Period of fruitage in August and September. This grass is a weedy annual introduced from Europe, and is found in both waste and cultivated grounds, and along roadsides, and is of no agricultural value.

ERAGROSTIS PURSHII.

Schad.

Southern Spear Grass.

An annual grass with slender culms sparingly branched from near the base, bent at the lower joints, then upright, six inches to eighteen inches high, roots fibrous: Leaves narrow, pointed and flat. Period of fruitage, August and September.

Found in waste places, sandy river banks, and along roadsides. Stock eat it readily as a forage plant, but it is too scarce to be of much value.

ERAGROSTIS ERAGROSTIS.

(L.) Karst.

Low Eragrostis.

Annual, culms seldom over fifteen inches tall, tufted, usually decumbent and much branched, and smooth. Leaves one to three inches long and narrow, smooth beneath and rough above. Period of fruitage, July to September.

Introduced from Europe and now found in many waste places and cultivated grounds. Owing to scanty herbage it is of no

agricultural value.

ERAGROSTIS PECTINACEA.

(Mich.) Stend.

Purple Eragrostis.

An erect, perennial grass, from one to three feet high, with short stout rootstocks, and large spreading red purple heads or panicles. Period of fruitage in August and September. Found in dry sandy soil, and of no agricultural value.

ERAGROSTIS TRICHODES.

(Nutt.) Nash.

Hair-like Eragrostis.

Culms two to four feet tall, erect, simple and smooth. Leaves six to twenty-four inches long, one-eighth to one-fourth wide, smooth beneath, slightly scabrous above, with a long slender tip. Panicle eight to twenty-four inches in length, narrow and elongated, the branches erect or ascending, capillary, subdividing, somewhat flexuous; spikelets usually pale, many-flowered. Period of fruitage, August and September.

Found in dry sandy soil, and of little or no agricultural value.

ERAGROSTIS HYPNOIDES.

(L.) Nees.

Creeping Eragrostis.

A prostrate, much branched and extensively creeping annual, with ascending, flowering branches, three to six inches high, with spreading leaf blades, two inches long. Period of fruitage in August and September. Found in ditches and sandy or gravelly waste

places along streams. Of no agricultural value.

EATONIA OBTUSATA.

(Michx.) Gray.

Early or Prairie Bunch Grass.

Culms erect, rather slender, unbranched, tufted, roughish, from fourteen inches to two and one-half feet high; roots perennial, fibrous; leaves numerous, flat, rough, two to six inches long.

Early bunch grass is distributed throughout the state in dry and slightly moist places. It is one of the early species, ripening its seeds from June to August. Where this grass is in sufficient quantities, it furnishes good pasture, and is one of the best of the native grasses. In South Dakota it furnishes valuable hay.

EATONIA PENNSYLVANICA.

(D. C.) Gray.

Eaton's Grass.

Culms erect, slender, simple, tufted, smooth and shiny, one and one-half to three and one-half feet in height, arising from perennial, fibrous roots. Leaves flat, rough, three to six inches long. Period of fruitage, June and July. A native grass found in low meadows and damp, shady woods. Not common enough to be of much importance, but when it does occur, stock eat it readily.

KOELERIA CRISTATA.

(L.) Pers.

Prairie June Grass.

Culms erect, tufted, one to two and one-half feet high, from perennial, fibrous roots; leaves flat, those arising from the

root, a foot or more long. The whole plant frequently covered with short hairs. Period of fruitage, July to September. This is one of the earlier and common grairie grasses. The seeds usually ripen in July. This species is one of the most valuable of native grasses, as it does well on dry sandy soils, on both hillside or prairie, and is readily eaten by stock. Where soil conditions are favorable, and it is found in sufficient quantities, it can be cut and yields a good early hay.

In South Dakota it affords excellent forage.

MELICA MUTICA.

Walt.

Melic Grass.

A perennial grass, growing sparingly in rich, rocky woods in many places. It grows in loose tufts, the culms about two feet high, the lower leaves and sheaths soft, hairy, the upper leaves narrow, three to four inches long, gradually pointed. The panicle is nearly simple or little branched, the spikelets loosely arranged on the branchlets.

This grass is eaten and relished by cattle, but is probably not well adapted to cultivation. Period of fruitage, June and July.

KORΥCARPUS DIANDRUS.

(Michx.) Kuntze.

American Korycarpus.

An erect perennial, two to four feet high, with long, narrow, lanceolate, nearly erect leaves. Stem very rough below the panicle. Sheaths overlap. Period of fruitage in August and September. Found only in rich woods and hillsides, and of little value.

UNIOILA LATIFOLIA.

Michx.

Broad Leaved Spike Grass.

A native, erect grass, with rather stout, simple stems or culms, two to five feet high. Has broad spreading leaf blades, four to ten inches long, one-half to one inch wide, and a drooping panicle or head, five to ten inches long. It has strong creeping root stocks, and is usually found along streams, and shaded banks.

With its graceful top and broad leaves it is pleasing in appearance and ornamental. Period of fruitage is in August and September. It has little or no agricultural value.

DACTYLIS GLOMERATA.

L.

Orchard Grass.

An introduced species, in some places escaped from cultivation, and found growing wild in many parts of the state.

Culms erect, tufted, rough, two to four feet high, arising from tough, perennial, fibrous roots, leaves flat and broad, often eighteen inches long, rough on both sides and light green in color. It makes a strong, rank growth, starts early in the spring, stands drought better than timothy, and gives a heavier yield. Orchard grass is eaten by all kinds of stock, and makes nutritious hay if cut while in bloom.

It is valuable for pasturage also, and grows well in the shade. Owing to its habit of growing in bunches, it has to be sown thickly. When used for pasture, it should be grazed closely and not allowed to seed much. Under proper conditions this grass has a long season of growth, and yielding a larger amount of forage throughout

the year than most other common grasses.

POA FLAVA.

L.

Fowl Meadow Grass.

Culms erect, tufted, from one and one-half to five feet high, arising from perennial, fibrous roots. Leaves narrow, two to seven inches long, smooth and soft. Panicle four to twelve inches long, branches spreading or ascending. Found in low native meadows, and is an excellent grass for lands that are overflowed occasionally.

It does not form a dense sod, but furnishes an abundance of excellent forage, which remains edible for a long time, as the stems do not become hard and woody.

POA PRATENSIS.

L.

Kentucky Blue-grass. June Grass.

An introduced species, now growing wild in many places. Culms erect, smooth, tufted at first, but spreading rapidly by means of the strong, creeping root stocks, and at length forming a firm even sod. Stems, usually from one to three feet high, perennial. Leaves arising from the root stock much longer than those from the stem. This is one of the best pasture grasses grown in the United States. Thrives on most soils. When growing wild, does not yield as well as some of the other grasses, but is more nutritious, as it retains its nourishing properties better when dried.



POA ANNUA

L.

Annual Meadow Grass.

An introduced variety, about one foot tall, growing from an annual fibrous root. Stems erect or decumbent at the base, somewhat flattened and smooth. Panicle two to four inches long, open, branches spreading, naked at the base. Period of fruitage, May to October.

Found in waste, and cultivated places throughout the state. Cows and stock eat it readily, but owing to its short length, does not furnish much forage.

Owing to its palatability, and the readiness with which stock eat it, this grass must be classed among those having some agricultural value.

POA SYLVESTRIS.

Gray.

Woodland Spear Grass.

A slender, native, tufted, perennial grass, with soft, smooth, slender, slightly flattened stems, one to three feet high. Leaves rough above, and smooth below, one-sixteenth inch wide, two to six inches long. Basal leaves the longest.

Panicle oblong or pyramidal in form, three to seven inches long, the branches ascending, sometimes reflexed when old. Period of fruitage, June and July.

Found in rich thickets and meadows and of little agricultural value.

POA ALSODES.

Gray.

Grove Meadow Grass.

Culms eight to thirty inches tall, erect, soft, slender and smooth. Leaves usually rough, one-eighth inch wide, those along the stem being from two to seven inches long, while those from the base are longer. The upper leaves clasping the base of the narrow and loose panicle. Panicle, three to eight inches long, with ascending branches; spikelets one-fourth inch long, light green in color. Period of fruitage in May and Juny.

Found in sunny thickets and woods. Of little or no agricultural value.

POA WOLFI.

Scribn.

Wolf's Spear Grass.

Culms from twelve to thirty-six inches tall. Leaves

narrow, smooth beneath, rough above, abruptly pointed, stem leaves about four inches long. Basal leaves much longer.

Panicle, from four to eight inches long, its branches erect or ascending. Flowering scales about one-eighth inch long, webbed at the base, five nerved. This is a rather rare form and not widely distributed. Of little agricultural value.

Found in woods and thickets in May and June.

POA BREVIFOLIA.

Muhl.

Short Leaved Spear-grass.

An erect perennial, one to three feet high, with running root stocks, narrow, short stem leaves, smooth beneath, rough above. Basal leaves longer. Widely spreading, few flowered panicles or heads, branches erect or ascending. Period of fruitage, April to June. Found along wooded river bluffs and grassy summits.

Of little agricultural value.



POA COMPRESSA.

L.

Wire Grass.

English Blue Grass, Canada Blue Grass.

Culms eight to twenty-four inches tall, flattened, bent below, then upright, arising from long, tough, perennial root stocks. Leaves from one to four inches long, about one-sixteenth inch wide, usually rough above and smooth beneath. Panicle short and narrow, pale blueish green, usually contracted, with the branches ascending, one to two inches long, bearing the spikelets nearly to the base of the panicle. Period of fruitage from June to August. Found in dry waste places and cultivated ground, and frequently in open woods.

While this species is one of the best for the thin, worn-

out soils of the eastern states, it hardly can be recommended for Illinois, wherever Kentucky blue grass can be grown. On our poor worn-out soils in Southern Illinois, this grass makes fair pasture, on soils too poor to support other grasses. Stock eat it readily when green. On cultivated fields farther north, this grass is inclined to be a weed, and owing to its persistent habit, is hard to eradicate.

PANICULARIA CANADENSIS.

(Michx.) Kuntz.

Rattlesmake Grass.

A stout, native, perennial grass, two to three feet high, with large flat leaf blades, six to ten inches long, rough, and ample, nodding panicles or heads; spikelets flattened, turgid. Flowering and fruitage period in July and August. Found in swamps, wet grounds, and meadows.

This species is not common, and has received no attention from the agriculturist. It is similar to *Panicularia Americana*, which is liked by cattle, and makes a good pasture grass for wet lands. It is the handsomest species of the genus.

PANICULARIA NERVATA.

(Willd.) Kuntze.

Fowl Meadow Grass. Nerved Manna Grass.

A leafy perennial, one to three feet high, with expanded, nodding panicles, often purple, and rather small spikelets. Leaf blades smooth beneath and rough above, six to twelve inches long. Period of fruitage, June to September.

Found in wet meadows and marshes. It is variable in size

according to soil and location. It is of some value as a fodder plant for moist meadows, and makes good hay. This grass is of some value as food for water fowls, and for this purpose is planted in game preserves.

PANICULARIA FLUITANS.

(L.) Kuntze.

Floating Meadow Grass.

Culms smooth, upright, from a creeping root stock or base, two to five feet high, roots perennial; leaves six inches to one foot long; sheaths smooth or rough. Panicle one foot long.

Period of fruitage from July to September.

Found only in wet muddy places, it makes excellent fodder, and is valuable for swampy meadows. It is a valuable grass in game preserves, being a favorite food for all kinds of water fowl.

FESTUCA OCTOFLORA.

Walt.

Slender Fescue Grass.

Culms four to eighteen inches tall, erect, slender, rigid, simple and smooth, arising from an annual root. Leaves bristle like, from one to three inches long. Panicle contracted, two to three inches long, often one-sided, with from seven to thirteen spikelets. Period of fruitage from June to August.

Found in dry sandy soil, and of little or no value to agriculture, owing to its sparse foliage.

FESTUCA ELATIOR.

L.

Tall Fescue.

An upright perennial grass, with stout, erect, smooth, simple stems, from two to five feet high. Leaves large, broad, and flat, five to fifteen inches long; panicle narrow, erect, with short branches; spikelets crowded, five to ten flowered. Introduced from Europe, and now growing wild in fields and along waysides.

Period of fruitage in July and August. When cultivated, is a coarse growing grass, yet very nutritious and productive. Adapted to moist, stiff or clayey soils. It is readily eaten by stock when green, and makes excellent pasture. When properly prepared, it makes excellent hay.

FESTUCA NUTANS.

Willd.

Nodding Fescue Grass.

Perennial, culms stout, two to four feet tall, erect, simple, smooth, naked above; leaves broadly linear, flat, taper-pointed, three to twelve inches long, generally rough. Panicle of several long, divergent spreading, or drooping branches, rough and naked below; spikelets few, three to five flowered. Period of fruitage in July and August.

Found in waste places and open woodlands where it matures early, but is of little agricultural value.

FESTUCA SHORTII.

Kunth.

Short's Fescue-grass.

Perennial. Culms or stems two to four feet tall, erect.

Leaves four to eight inches long, narrow, flat, smooth beneath, rough above. Panicle from three to eight inches in length, open, the branches spreading or ascending, rarely erect. Found in woods and thickets, in July and August. Of little value to agriculture.

BROMUS CILIATUS.

L.

Fringed Brome Grass.

Perennial, culms stout, usually smooth, three to five feet high; sheaths often shorter than the internodes, smooth or rough, often softly pubescent; leaves large, six to eight inches long, one-fourth to three-eighths inches wide. Panicle compound, very loose, the branches divergent, drooping; spikelets seven to twelve flowered, three-eighths to three-fourth inches long, silky, hairy near the margins, smooth on the back. Period of fruitage, July and August.

Found in woods and thickets, making a vigorous growth early in the season. Though somewhat scattered, furnishes good forage.

BROMUS PURGANS.

L.

Hairy Brome Grass.

Culms from two to three and one-half feet high, stem stouter than in Ciliatus, otherwise resembling it. Panicles Drooping, the flowering glumes silky, hairy all over.

Somewhat common in moist meadows, where it furnishes good forage, although seldom in large quantity.



BROMUS SECALINUS.

L.

Cheat or Chess.

An erect annual, two to four feet high, with flat leaf blades from six to twelve inches long. Panicles more or less expanded, with turgid, short awned spikelets, which are pendulous when in fruit. Period of fruitage, June to August. Naturalized from Europe and now found in cultivated fields and waste places. It is now classed as one of the most troublesome weeds of the wheat fields.

BROMUS TECTORUM.

L.

Downy Brome Grass.

Culms six inches to two feet tall, arising from an annual

root, simple, erect, and smooth. Sheaths usually longer than the internodes, the lower softly pubescent. Leaves one to four inches long, softly pubescent. Panicle two to six inches long, open, the branches slender and drooping, somewhat one-sided; spikelets numerous, on slender recurved pedicels. An introduced species, found in fields, and waste places about cities. It is becoming a troublesome weed, and of little value for forage purposes. Period of fruitage from May to July.

BROMUS KALMII.

Gray.

Kalm's Chess.

A perennial grass, with stout stems, one and one-half to three feet tall, erect, simple and smooth. Sheaths shorter than the internodes, more or less pubescent; leaves narrow and few, two and one-half to seven inches long, sparingly pubescent. Panicle simple, two to six inches long, open, its branches flexuous; spikelets on slender flexuous pedicels. Period of fruitage, July and August.

Found in woods and thickets, but of little or no agricultural value.

BROMUS HORDEACEUS.

L.

Soft Chess.

An erect annual from eight inches to three feet high. Differs from Cheat or Chess in that the panicle is more erect and hairy. Leaves one to seven inches long, pubescent. Panicle frequently contracted, its branches erect or ascending, one to two inches long, the spikelets being on short pedicels. Introduced

from Europe, but now escaped and has become a weed. Period of fruitage, July and August. Found in fields and waste places.

Recommended for cultivation where other grasses will not grow, but better left alone on good soil where blue grass and timothy abound.

BROMUS RACEMOSUS.

L.

Smooth Brome Grass. Upright Chess.

Annual, culms one to three feet tall, erect, simple, and smooth. Leaves flat, one to nine inches long and pubescent. Panicle loose, four to ten inches in length, branches erect and spreading; spikelets five to seven flowered, three-eighth to three-fourth inches long, erect and smooth. Period of fruitage, June to August.

This species is allied to *Bromus Secalinus*, and is cultivated in some places in the South. Found in fields and waste places in our state, and of very little value.

LOLIUM PERENNE.

L.

Perennial Rye-grass.

An erect, stout, smooth, leafy perennial, one to three feet high, with slender, erect, rigid terminal spikes, three to six inches long; spikelets eight to fifteen flowered; leaves narrow, from two to five inches long. Period of fruitage in July and August.

Introduced from Europe, and is now found in lawns, fields, and waste places. This is one of the oldest known grasses, and is valuable for permanent pastures on heavy soils in moist climates. Under favorable conditions will yield a good quality of hay.

LOLIUM ITALICUM.

A. Br.

Awned Rye Grass.

A biennial or perennial grass, two to three feet high, with slender, usually somewhat nodding, terminal spikes, and short, awned spikelets. Leaf blades four to eight inches long. Introduced throughout the United States by cultivation. A good hay grass, doing especially well upon rich, moist lands.

Is a rapid grower, and forms a good turf. It also is valuable for soiling, owing to its succulent character.

AGOPYRUM CANINUM.

(L.) R. and S.

Bearded Wheat Grass, etc.

Culms strong, upright, or bent at the lower joints, smooth, and from one and one-half to three feet high, arising from perennial fibrous roots. Leaves narrow, pointed and flat, sometimes rolled. Spikes closely flowered, from five to six inches long, frequently nodding. Period of fruitage, July and August. Quite common in places, but is of doubtful value to the agriculturist.

AGOPYRUM SPICATUM.

(Pursh.) S. and S.

Western Wheat Grass.

Culms from one and one-half to four feet tall, arising from a slender creeping root stock. Leaves erect, two to eight inches long, and about one-fourth inch wide, smooth beneath. Spike from four to eight inches long, the spikelets crowded along the spike.

This grass may be a variety of couch grass, as the foliage

and spikes are similar. It grows naturally on rather dry lands, and river bottoms, and furnishes a fair quality of hay.

AGOPYRUM REPENS.

(L.) Beauv.

Couch Grass. Quick Grass.

Culms stout, erect, green, two to four feet high, arising from stout, strong growing, creeping root stocks; leaves thin, flat, long and numerous. Spikes narrow, three to six inches long; spikelets four to eight flowered, smooth or nearly so, about one-half inch long, rather closely appressed to the stem. Period of fruitage, July to September. This is a weedy perennial grass, occurring in both cultivated and waste places, and difficult to eradicate on account of its many long, underground stems.

Stock eat this grass readily when green, but later refuse it, as the stems become hard and woody. When cut while in bloom it makes a nutritious hay. But can not recommend it for cultivation, as it is too hard to control when once established.

AGOPYRUM DASYSTACHYUM.

(Hook) Vasey.

Northern Wheat-grass.

Culms one to three feet tall, from long running root stocks; leaves from two to ten inches long, narrow and flat, smooth beneath, rough above, becoming involute in drying. Spike three to eight inches long, spikelets four to eight flowered.

Found during summer along streams and sandy places. Of little value to agriculture.



HORDEUM JUBATUM.

L.

Squirrel-tail Grass.

Culms erect, smooth and tufted, eight to eighteen inches high, arising from annual fibrous roots; leaves flat, with roughened blades and smooth sheaths. Spikes erect or nodding, pale green or straw colored, two to four inches long. Awns or beards one to two or more inches long, spreading, giving the spike a bushy appearance. Period of fruitage, June to August.

Found on all kinds of soil, and is one of our worst weeds. When young, stock will eat the grass, but later the awns from the heads get into the cattles mouths and cause irritation. When ripe the spikes break up into small sections, these attach themselves to the skins of animals or clothing of man, and cause discomfort, by this means the seeds are frequently scattered.

Being an annual, all that is necessary to eradicate it, is careful cultivation, to prevent the heads from forming.

HORDEUM NODOSUM.

L.

Meadow Barley. Barley Grass.

An annual grass, culms six inches to two feet tall, erect, occasionally decumbent, simple and smooth. Leaves one and one-half to five inches long, flat, and rough. Spikes erect, one to three and one-half inches long; spikelets usually in 3's. Period of fruitage, June and July.

Found in meadows and waste places, and of little agricultural value. Probably an introduced species.

HORDEUM PUSILLUM.

Nutt.

Little Barley.

An introduced species, with stems from four to fifteen inches tall, erect or decumbent at the base, smooth and glabrous. Leaves one-half to three inches long, erect, smooth beneath, rough above. Spike one to three inches long; spikelets in 3's. Period of fruitage, June and July.

Found in dry soil, of no agricultural value and is classed among the weeds. While young, it affords some picking for cattle.

ELYMUS STRIATUS.

Willd.

Slender Wild Rye.

Culms slender, tufted, upright, two to three feet high, arising from creeping, perennial roots; leaves thin, long, flat and

somewhat rough; spikes rather slender, more or less nodding, two to four inches long; spikelets, usually in 2's, whole plant more or less hairy. Period of fruitage, June and July.

Found in moist places, along streams, and in moist open woods and thickets. Of little value for forage, owing to its scarcity. Where found, however, stock eat it readily while young.

ELYMUS CANADENSIS.

L.

Nodding Wild Rye.

Culms robust, erect and tufted, smooth, two to four feet high, arising from perennial, creeping roots; leaves large, long, broad and flat, either smooth or rough. Spikes large, from four to nine inches long, nodding; spikelets, mostly in 2's, sometimes more. The glumes provided with long rough awns. Period of fruitage, July and August.

Found growing in moist places and along river banks. In some places, furnishes considerable native forage. Where found in sufficient quantity, and cut while young, furnishes a fair quality of hay. In shady places and in bottoms it frequently furnishes good grazing while young.

ELYMUS HIRSUTIGLUMIS.

S. and S.

Strict Wild Rye.

A rather stout, erect, leafy perennial, two to three feet high, with smooth culms and sheaths, and erect, slender spikes, one and one-fourth to three inches long, stout, stems hairy; spikelets, crowded, in pairs. Leaf blades erect, from four to seven inches

long, one-fourth to three-fourth inches wide, acuminate, very rough on both surfaces. Period of fruitage from July to August. Found along river banks and moist places. Of little or no agricultural value.



ELYMUS VIRGINICUS.

L.

Virginia Wild Rye.

Culms robust, tufted, erect or sometimes ascending, smooth, one and one-half to three feet high, arising from perennial, fibrous roots; leaves six inches to one foot long, broad, flat and

rough, the upper sheath often enclosing the base of the spike; spike erect, rigid, and dense, from two to five inches long and about one-half inch thick; spikelets in 2's or 3's; flowering glume with a stiff straight awn, usually one-half to three-fourth inches long.

Period of fruitage, July and August.

Found in moist soil, along streams, and in open woodland pastures. It has some appearance of agricultural value, but forms a poor turf, and the lower leaves are usually dead before the plant blooms. In the South and West the grass, when young, possesses some value as a native pasture grass.

When cut for hay, it should always be cut before plant blooms, as the stems become harsh, and the lower leaves die and fall off.

HYSTRIX HYSTRIX.

(L.) Millsp.

Bottle Brush Grass.

A smooth, perennial grass, from two to four feet high, with broad flat leaves, and terminal spikes, two and one-half to five inches long; leaves from five to ten inches long. Spikelets about one-half inch long, at first erect, but widely spreading when in fruit. Flowering glumes with awns about one inch long. Period of fruitage in June and July. Found in rich, rocky, woods and moist, shady places. Of little agricultural value, although the young plants afford some picking in woodland pastures.

ARUNDINARIA TECTA.

Muhl.

Small Cane.

Culms three to fifteen feet tall, erect, shrubby, branching at the summit, smooth; leaves lanceolate, three and one-half to eight inches long, flat, pubescent beneath, smooth above; racemes terminal, or on short stems; spikelets one to one and one-half inches long, on pedicels one inch long. Period of fruitage, May to July.

Found in swamps and low lands in southern part of the state. The young stems and leaves furnish forage for cattle, but contain little nourishing or fattening quality.

DIPLACHNE FASCICULARIS.

Salt-meadow Diplachne.

An erect, ascending or more or less diffusely spreading, much branched annual, one and one-half to two feet high, with numerous erect, crowded spikes, two and one-half to three and one-half inches long. Spikelets short. The lower part of the panicle usually enclosed in a sheath. Leaf blades three to twelve inches long; flowering glume with a prominent awn, two to four toothed. Period of fruitage, July to September.

Found in brackish marshes and wet places. Has no agricultural value.

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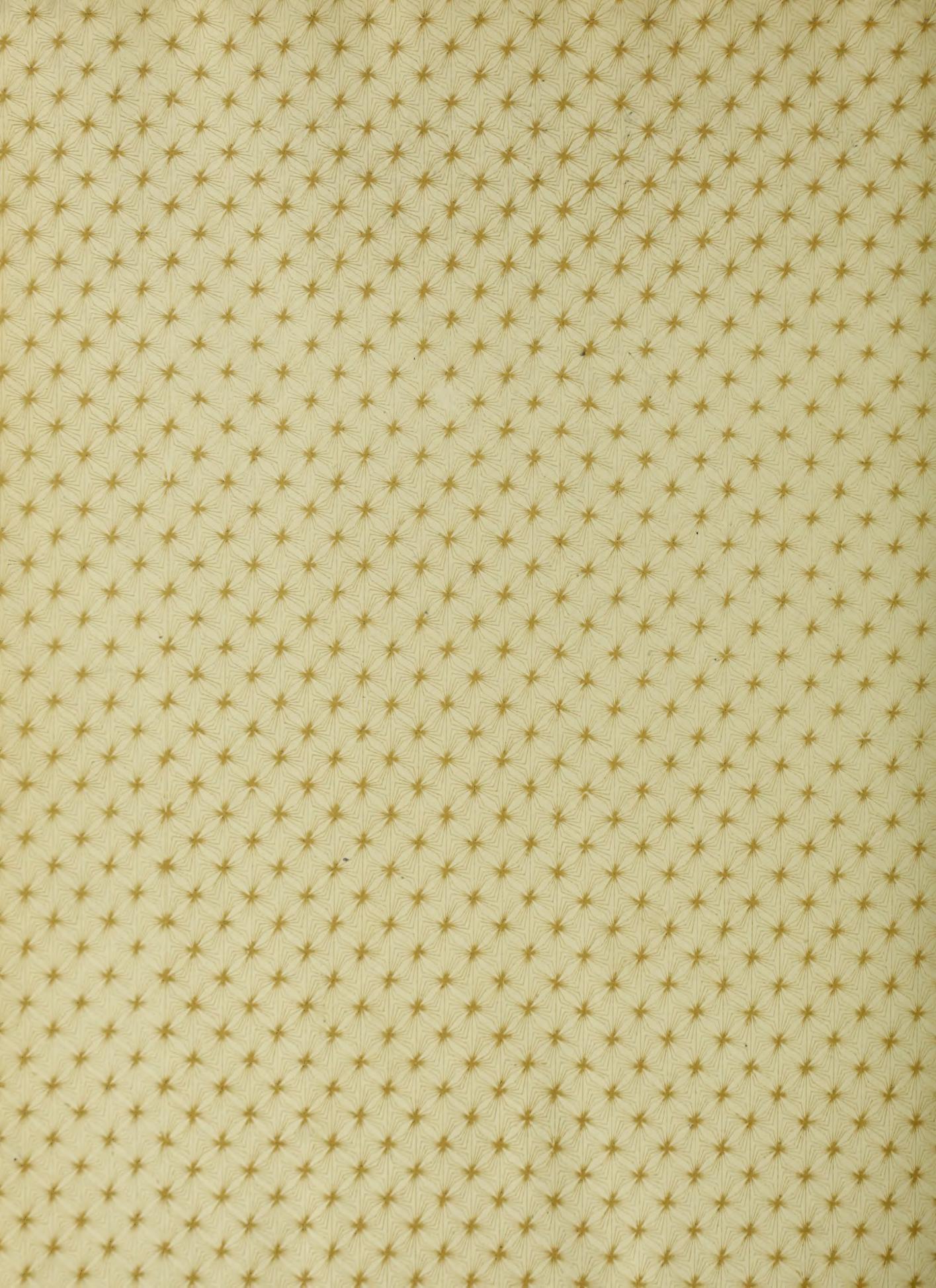
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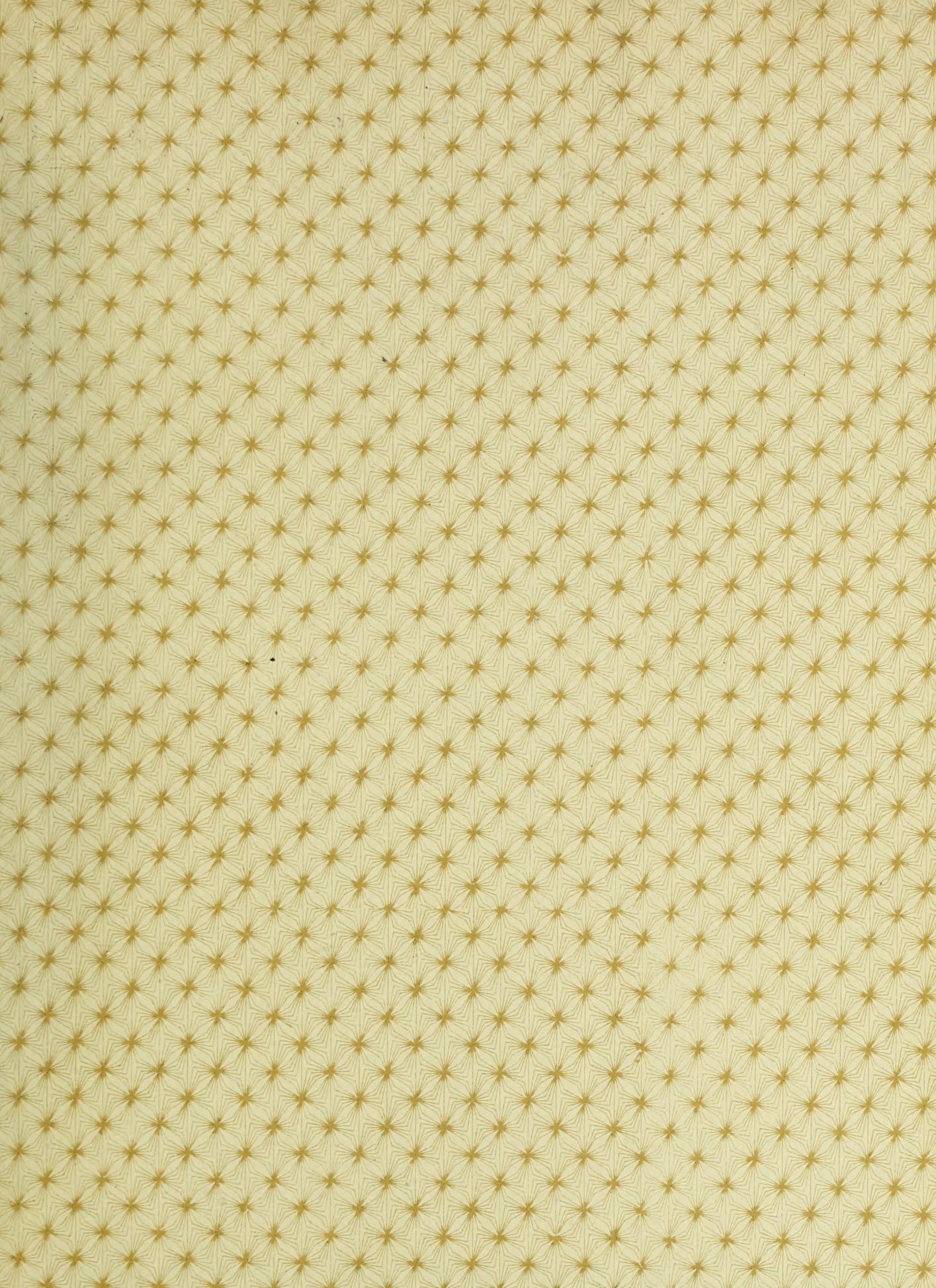
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